FRD ACTIVITIES REPORT
April - June 2014

RESEARCH PROGRAMS

Project Sagebrush

Major progress was made on putting together a comprehensive data report for Phase 1 of Project Sagebrush, designated SAGE13. The report will provide a detailed description covering all aspects of experimental design, instrumentation, measurements, quality control procedures, and the final database for the project. The largest gap in the data report is related to the availability of meteorological measurements from Washington State University (WSU). When those become available it will be possible to complete the report. It is our understanding that these data will become available in July.

Measurements continue on the Grid 3 tall tower in collaboration with WSU. These were begun as part of Project Sagebrush in late September and will continue into at least August. The combination of measurements provided by WSU and FRD will provide a very detailed look at the vertical profiles of turbulence. Ultimately the Grid 3 tower measurements will provide data for the Project Sagebrush tracer tests as well as a rich database for separate comprehensive analyses of vertical turbulence structures over a broad range of conditions. Bruce Hicks has been provided with data collected by FRD from September through April to assist him with his lines of research. Receipt of the WSU portion of the data is pending.

Some preliminary analyses of the tracer data sets have been conducted and that has led to some unexpected results with regard to the plume dispersion parameters σ_y and σ_θ. We are presently attempting to identify the source(s) of the differences between our observations and those from decades old studies that have provided the basis for much of accepted dispersion science. (Dennis.Finn@noaa.gov, Rick Eckman and staff)

In preparation for the next field test of Project Sagebrush, the bags in an additional 280 air sampler cartridges are being sealed and the inlet tubing replaced. This will bring the total number of sampler cartridges to approximately 840, allowing the completion of five testing periods without analyzing the air samples. (Roger.Carter@noaa.gov, and staff)

Birch Creek Valley Wind Flow Study

The draft manuscript “Diurnal Late Spring and Summertime Wind Patterns on the Snake River Plain and the Influence of Complex Terrain Factors” is currently in internal FRD review. It summarizes results from the first phase of the Birch Creek Valley measurements. Follow up work on the second phase is stalled pending availability of data from the U.S. Forest Service Fire Sciences Laboratory. (Dennis.Finn@noaa.gov)

ARL Convective Initiation Project

By March, ARL had received eleven applications for the post doctorate associate position that will be assisting with numerical modeling for the convective initiation project. The top candidates were interviewed but ultimately passed over for various reasons. As a result, ARL re-advertised the position in May and June, receiving eleven new applications. The location options were limited to the Oak Ridge and Idaho Falls divisions in the re-advertisement. Interviews of the new top candidates will start in July.

ARL started the 2014 convective initiation field study near Huntsville, Alabama in late June. ATDD is handling the instrument deployments and FRD is archiving output from the High Resolution Rapid Refresh (HRRR) model to support the study. The output from the full HRRR domain is too large to download, so the archiving is limited to an approximately 275 × 275 km sub-domain over northern Alabama. A new HRRR forecast is generated hourly, so twenty-four forecasts of 15 hours duration each are archived every day. The archiving software also generates various convection-related parameters from the forecasts. These parameters are based on a relatively new convection concept called the Heated Condensation Framework. (Richard.Eckman@noaa.gov)

Wind Forecast Improvement Project (WFIP)

FRD continues to plan for instrument deployments in the wind farms located to the east of Idaho Falls. Division staff visited one of the wind farms owned by British Petroleum and discussed the deployments with the on-site team that maintains the turbines. The farm has three 80 m meteorological towers. The most difficult issue will be finding a good location for a 915 MHz radar wind profiler. Locations with AC power also tend to have nearby turbines that can interfere with the radar signal. For the surface-based flux instrumentation, the southernmost meteorological tower on the farm appears to be a promising location. FRD will not be able to move ahead with any plans until a final NOAA budget is approved. (Kirk.Clawson@noaa.gov, Rick Eckman)

HYRad

At the request of our DOE Emergency Operations Center (EOC) client, work began on implementing the use of multiple sources for plume modeling in HYRad. This was successfully accomplished in limited testing that identified the requisite file formats but further work is necessary to implement it through the user interface. (Dennis.Finn@noaa.gov, and Brad Reese)

FRD has received three inquiries from different parties about the implementation of HYRad on their own local systems. One inquiry was from our EOC client. A second inquiry was received from an Idaho State University research group working on probabilistic dose modeling assessment. The third inquiry was from the DOE Emergency Management Issues Special Interest Group (EMI SIG) Subcommittee on Consequence Assessment and Protective Actions (SCAPA) chairman Cliff Glantz regarding possible wider usage at other DOE facilities. This indicates the high regard with which HYRad is held among our various colleagues. However, there are difficulties in complying with these requests. The guts of HYRad that provide actual plume dispersion, dose calculation, and plume file generation could be rather readily exported for wider usage, but much of what is regarded as HYRad is the user interface that generates the appropriate input files, displays the plume(s) and other output, and handles a multitude of other tasks. That part of HYRad is highly customized to the FRD system and INL EOC applications, and this would be a much more complicated effort to export to other users and facilities. FRD is evaluating how to most effectively respond to these inquiries. The aim is to provide as much as reasonably possible without getting saddled with an effort for which staff and funding are not available. (Brad.Reese@noaa.gov & staff)

Big Southern Butte

The following manuscript was published as a discussion paper in Atmospheric Chemistry and Physics:

Butler, B. W., Wagenbrenner, N. S., Forthofer, J. M., Lamb, B. K., Shannon, K. S., Finn, D., Eckman, R. M., Clawson, K., Bradshaw, L., Sopko, P., Beard, S., Jimenez, D., Wold, C., and Vosburgh, M.: High resolution observations of the near-surface wind field over an isolated mountain and in a steep river canyon, Atmos. Chem. Phys. Discuss., 14, 16821-16863, doi:10.5194/acpd-14-16821-2014, 2014. (Dennis.Finn@noaa.gov)

Tennessee Tracer Study

In early April Rick Eckman attended a meeting in Oak Ridge, Tennessee to discuss a possible tracer study at a Clinch River location where the Tennessee Valley Authority is planning to build modular nuclear reactors. Several organizations attended the meeting, which included a visit to the proposed reactor site. Shortly after the meeting, however, the company identified to build the reactors (Babcock & Wilcox) cut spending on its mPower reactor design due to lack of utility customer interest. This left the status of the Clinch River project unclear and likely eliminated any chance of a tracer study in the short term. (Richard.Eckman@noaa.gov)

NOAA/IDAHO NATIONAL LABORATORY (INL) METEOROLOGICAL RESEARCH PARTNERSHIP

NOAA/INL Mesonet

A primary area of focus for FRD is the reliability of the INL mesonet and its communication system. A number of efforts to improve this have been in progress this quarter. Chronic communication problems at the Minidoka station were investigated and found to be a radio interference problem, apparently due to a commercial power line problem. FRD worked with Idaho Power Company to find the problem and get it corrected. In a separate project, a telephone line connection is being installed to one station on the INL site. Data from this station will be collected via the telephone line while the others remain on the existing radio system. This will allow data collection from this station when the radio system is down, providing some weather information to on site facilities during these outages. Although these outages are very infrequent, they can be very disruptive as they were this past winter. Future plans include moving a small number of stations to other communication systems which reduces the likelihood of total outages. Additionally, a number of software diagnostic tools that provide better visibility of the mesonet health have been implementing. These should allow problems to be anticipated and corrected before they result in significant communication failure. FRD is also working with Campbell Scientific to implement the latest generation of radio frequency modems which should improve system communications. Unfortunately, the device being tested not only fails to improve the collection system reliability, it fails to work. Hopefully, Campbell Scientific will find a solution. (Roger.Carter@noaa.gov , Shane Beard, Tom Strong, Brad Reese)

The semiannual calibration and maintenance procedures for the spring season were completed this quarter.

Emergency Operations Center (EOC)

Team B participated in an EOC drill on April 2. The drill scenario involved an active shooter at the IRC building in Idaho Falls. Real weather was used for the drill. FRD's participation centered around a snow shower that moved into the area during the drill. Heavy, wet snow accumulated during the event and FRD kept the EOC and security managers appraised of its arrival and departure, expected snow accumulation, and its potential impacts on the drill.

EOC Team D participated in a drill on May 28 that involved a security event and small fire at the Materials and Fuels Complex. No atmospheric releases were included in the scenario, so NOAA's involvement was limited.

An EOC drill was conducted on June 4. It simulated a forklift accident resulting in the release of minor quantities of radiological material at the Advanced Mixed Waste Treatment Plant. The release was contained within the building but there was a request for a HYRad plume model.

INL Hazardous Weather Alert System

Thirteen hazardous weather statements were issued last quarter. Nine of the alerts were due to high winds and the remainder were issued for lighting.

OTHER ACTIVITIES

Safety

Defensive driving video was viewed during the April staff meeting.

Fire extinguisher training was given at the June staff meeting that provided all employees "hands on" experience with putting out a fire with a fire extinguisher.

At the May staff meeting, employees viewed a video on gas cylinder safety.

Computer IP address change

In May, our internet service provider, the INL computer network organization, informed us that the IP addresses of all our computers would be changing. This meant that all the equipment that the computers interface to and control would need to change and all the organizations throughout the INL and across the country with which we share data would need to make changes to their systems. After several weeks of planning and a couple weeks of sometimes frenzied activity, the changes were successfully completed with the exception of a few minor mysteries that remain under investigation. (Brad.Reese@noaa.gov , Roger Carter, and staff)

Travel

Rick Eckman traveled to Oak Ridge, TN to attend a planning meeting for a proposed tracer study, March 31 to April 3.

Kirk Clawson traveled to Washington D.C. for to attend the EMI SIG DMCC & SCAPA meeting April 21-25. He presented a live demonstration of HYRad to the SCAPA group.

Donna Davis traveled to San Diego, CA for Federal Appropriations Law training June 16-20.

Kirk Clawson traveled to Fairfax, VA to attend give a presentation on Project Sagebrush at the annual George Mason University Conference on Atmospheric Transport and Diffusion Modeling, June 23-26.

Training

Brad Reese, Tom Strong, Shane Beard and Donna Davis attended several free safety training classes offered at the Safety Fest held at the Shoshone Bannock Tribes Convention Center on April 22-23. Courses included Cylinder/Gas Handling Safety, Safety Leadership, Fall Protection, NTSI Defensive Driving, and Fork Lift Training.

Donna Davis participated in the Acquiring Excess Personal Property class on April 24, 2014.
Kirk Clawson, Rick Eckman and Donna Davis completed the mandatory annual Purchase Card training.

In May, Kirk Clawson and Donna Davis completed the Personal Property Management Concepts course.

Donna Davis participated in a webinar on June 5, 2014 titled "A Hidden Workplace Epidemic (Prescription Painkiller's Impact)"

Donna Davis attended a webinar on the topic of Healthy Aging and the Brain, which was presented on June 11.

Donna Davis attended Federal Appropriations Law training in San Diego, CA, June 16-20.